

# TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.  
EN9-95-064BV

In Re Application Of: Papathomas et al.

Serial No.  
09/471,520 /

Filing Date  
12/23/99

Examiner  
Berman, S.

Group Art Unit  
1711 /

Invention: LEAD PROTECTIVE COATING COMPOSITION, PROCESS AND STRUCTURE THEREOF

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TC 1700

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DOCKET NO. EN9-95-064BV

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants/Appellants: Papathomas et al.	)	Examiner: Berman, S
	)	
Serial No.: 09/471,520	)	Art Unit: 1711
	)	
Filed: 12/23/99	)	

**RECEIVED**  
**JUL 28 2003**  
**TC 1700**

**For: LEAD PROTECTIVE COATING COMPOSITION, PROCESS AND STRUCTURE  
THEREOF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**BRIEF OF APPELLANTS**

This Appeal Brief, pursuant to the Notice of Appeal filed May 21, 2003, is an appeal  
from the rejection of the Examiner dated February 21, 2003.

**REAL PARTY IN INTEREST**

International Business Machines, Inc. is the real party in interest.

**RELATED APPEALS AND INTERFERENCES**

None.

**STATUS OF CLAIMS**

Claims 1, 6-8 and 13-20 are currently pending.

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## **STATUS OF AMENDMENTS**

There are no After-Final Amendments which have not been entered.

## **SUMMARY OF INVENTION**

The present invention discloses a composition and an associated process for reinforcing a bond using said composition, said composition comprising: a cyanate ester resin consisting essentially of a cationically polymerizable cyanate ester monomer, a cyanate ester prepolymer, or a mixture of the monomer and prepolymer; a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond; and a polymerization photoinitiator comprised of a catalytically effective amount of an organometallic complex salt having a metal cation, upon photolysis, said polymerization photoinitiator liberating at least one coordination site and polymerizing the cyanate ester substance, wherein said metal cation in the organometallic complex is selected from the group consisting of elements of Periodic Groups IVB, VB, VIB, VIIB, and VIIIB. See specification, page 19, lines 4-12.

The composition may further comprise a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyldimethoxysilane, 3-aminopropylethoxysilane, 3- glycidoxypopyl trimethoxysilane, 3-glycidoxypopylmethyl dimethoxysilane and combinations thereof. See specification, page 24, lines 18-21; the surface treating agent may include from about 3 to about 15 parts based on 100 parts of the resin. See specification, page 24, lines 18-23.

The composition may further comprise a toughening agent selected from the group consisting of hydroxy-terminated polysulfone oligomers, elastomers, rubber, epoxy terminated

elastomer, and combinations thereof; the polysulfone oligomers may have molecular weights ranging between approximately 500 and approximately 5000. The filler may include a fused or amorphous silica filler having a particle size from 0.5 to about 31 microns. See specification, page 25, lines 4-6. The surface treating agent is about 3 to about 15 parts based on 100 parts of the resin. See specification, page 24, lines 21-23.

### ISSUES

1. Whether claims 1, 6-8, 13, 16 and 17 under 35 U.S.C. §103(a) are unpatentable over Ayano et al. (4,383,903) in view of McCormick et al. (5,215,860).
2. Whether claims 1, 6-8, 13, 16 and 17 under 35 U.S.C. §103(a) are unpatentable over Gaku et al. (4,533,727) in view of McCormick et al. (5,215,860) and Shimp (4,709,008).
3. Whether claims 13-15 and 19-20 under 35 U.S.C. §103(a) are unpatentable over Ayano et al. in view of McCormick et al. (5,215,860), and further in view of Christie et al. (5,250,848) or Swei (5,182,173).
4. Whether claims 13-15 and 18-20 under 35 U.S.C. §103(a) are unpatentable over Gaku et al. (4,533,727) in view of McCormick et al. (5,215,860) and Shimp (4,709,008), and further in view of Christie et al. (5,250,848) or Swei (5,182,173).

## GROUPING OF CLAIMS

The claims are grouped as shown in Table 1:

Table 1

Group	Issue	Claims	Do Claims of Group Rise or Fall Together?
1	1	1, 7, 8	Yes
2	1	6, 13, 16, 17	No
3	2	1, 7, 8, 16, 17	Yes
4	2	6, 13	No
5	3	13, 14, 18	Yes
6	3	15	Yes
7	3	19-20	Yes
8	4	13, 14, 18	Yes
9	4	15	Yes
10	4	19-20	Yes

Groups 1-2 include the claims corresponding to Issue 1. Groups 3-4 include the claim corresponding to Issue 2. Groups 5-7 includes the claims corresponding to Issue 3. Groups 8-10 includes the claims corresponding to Issue 3.

The claims of Groups 1-2 (associated with Issue 1) do not rise and fall together with the claims of Groups 3-4 (associated with Issue 2), because the claims of Groups 1-2 and the claims of Groups 3-4 are rejected over different combinations of references.

The claims of Groups 1-2 (associated with Issue 1) do not rise and fall together with the claims of Groups 5-7 (associated with Issue 3), because the claims of Groups 1-2 and the claims

of Groups 5-7 are rejected over different combinations of references.

The claims of Groups 1-2 (associated with Issue 1) do not rise and fall together with the claims of Groups 8-10 (associated with Issue 4), because the claims of Groups 1-2 and the claims of Groups 8-10 are rejected over different combinations of references.

The claims of Groups 3-4 (associated with Issue 2) do not rise and fall together with the claims of Groups 5-7 (associated with Issue 3), because the claims of Groups 3-4 and the claims of Groups 5-7 are rejected over different combinations of references.

The claims of Groups 3-4 (associated with Issue 2) do not rise and fall together with the claims of Groups 8-10 (associated with Issue 4), because the claims of Groups 3-4 and the claims of Groups 8-10 are rejected over different combinations of references.

The claims of Groups 5-7 (associated with Issue 3) do not rise and fall together with the claims of Groups 8-10 (associated with Issue 4), because the claims of Groups 5-7 and the claims of Groups 8-10 are rejected over different combinations of references.

#### Claims of Groups 1-2

Table 1 shows that: the claims of Group 1 stand and fall together, while the claims of Group 2 do not stand and fall together. The claims of Group 2 do not rise or fall together, and do not rise or fall with the claims of Group 1, because each claim in Group 2 raises a unique issue not raised by any of the other claims in Group 2 and not raised in any of the claims in Group 1.

Claim 6 raises the unique issue of whether the cited references teach or suggest the following feature of claim 6: “wherein said cyanate ester substance is solvent free”, wherein said issue is not raised in any of claims 1, 7, 8, 13, 16, and 17.

Claim 13 raises the unique issue of whether the cited references teach or suggest the following feature of claim 13: “further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyldimethoxysilane, 3-aminopropylethoxysilane, 3- glycidoxypropyl trimethoxysilane, 3-glycidoxypropylmethyl dimethoxysilane and combinations thereof”, wherein said issue is not raised in any of claims 1, 7, 8, 6, 16, and 17.

Claim 16 raises the unique issue of whether the cited references teach or suggest the following feature of claim 16: “further comprising a toughening agent selected from the group consisting of hydroxy-terminated polysulfone oligomers, elastomers, rubber, epoxy terminated elastomer, and combinations thereof”, wherein said issue is not raised in any of claims 1, 7, 8, 6, 13, and 17.

Claim 17 raises the unique issue of whether the cited references teach or suggest the following feature of claim 17: “wherein said polysulfone oligomers have molecular weights ranging between approximately 500 and approximately 5000”, wherein said issue is not raised in any of claims 1, 7, 8, 6, 13, and 16.

#### Claims of Groups 3-4

Table 1 shows that: the claims of Group 3 stand and fall together, while the claims of Group 4 do not stand and fall together. The claims of Group 4 do not rise or fall together, and do not rise or fall with the claims of Group 3, because each claim in Group 4 raises a unique issue not raised by any of the other claims in Group 4 and not raised in any of the claims in Group 3.

Claim 6 raises the unique issue of whether the cited references teach or suggest the

following feature of claim 6: “wherein said cyanate ester substance is solvent free”, wherein said issue is not raised in any of claims 1, 7, 8, 13, 16, and 17.

Claim 13 raises the unique issue of whether the cited references teach or suggest the following feature of claim 13: “further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyl dimethoxysilane, 3-aminopropylethoxysilane, 3- glycidoxypropyl trimethoxysilane, 3-glycidoxypropylmethyl dimethoxysilane and combinations thereof”, wherein said issue is not raised in any of claims 1, 7, 8, 6, 16, and 17.



## ARGUMENT

### Issue 1

#### CLAIMS 1, 6-8, 13, 16 AND 17 UNDER 35 U.S.C. §103(A) ARE NOT UNPATENTABLE OVER AYANO ET AL. (4,383,903) IN VIEW OF MCCORMICK ET AL. (5,215,860).

The Examiner rejected claims 1, 6-8, 13, 16 and 17 under 35 U.S.C. §103(a) as allegedly unpatentable over Ayano et al. (4,383,903) in view of McCormick et al. (5,215,860).

### Claims 1, 7, and 8

Appellants respectfully contend that claims 1, 7, and 8 are not unpatentable over Ayano in view of McCormick, because Ayano in view of McCormick does not teach or suggest each and every feature of claims 1, 7, and 8. For example, Ayano in view of McCormick does not teach or suggest the feature “a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond” in claims 1 and 8, and a similar feature in claim 7. The Examiner alleges that “Ayano et al teach that the disclosed compositions can contain fillers ... (column 10, lines 41-47).”

In response to the preceding allegation by the Examiner, Appellants respectfully note that col. 10, lines 41-47 of Ayano mentions the existence of fillers (and other additives) in Ayano’s curable composition, but does not identify any specific filler substances and does not identify the amount of the filler (e.g., weight percent concentration) in the composition. Ayano does not teach or suggest any of said fillers or other additives are capable of “controlling thermal expansion of said composition and ... assisting in reinforcing said bond”. On the contrary, Ayano teaches in col. 10, lines 41-44 said fillers and other additives exist “to impact specific

properties”. What are these “specific properties”? Since Ayano identifies “fibrous reinforcement” as an example of said additive, it is clear that the “specific properties” include the structural properties of the composition relating to the composition being fibrously reinforced. Since Ayano identifies “pigments” and “dyestuffs” as example of said additives, it is clear that the “specific properties” include the color of the composition. Since Ayano identifies “thickening agents” as an example of said additives, it is clear that the “specific properties” include the thickening properties of the composition. Since Ayano identifies “lubricants” as an example of said additives, it is clear that the “specific properties” include the lubricating properties of the composition. Since Ayano identifies “flame retardants” as an example of said additives, it is clear that the “specific properties” include the flame retardation characteristics the composition. Since Ayano identifies “fillers” as an example of said additives, it is clear that the “specific properties” include the fullness of the composition. Appellants contend that the specific properties specifically identified by Ayano due not include the ability to reinforce a bond. Appellants further contend that the specific properties specifically identified by Ayano due not include the ability to control the thermal expansion of the composition, which is known to one of ordinary skill in the art as the coefficient of thermal expansion (CTE). Thus, Appellants maintain that Ayano does not teach or suggest that the composition includes a filler controls thermal expansion of the composition and assists in reinforcing said bond as required in claims 1, 7, and 8. Thus, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1, 7, and 8 of “a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond”.

Moreover, claims 1, 7, and 8 require that the filler satisfy not one requirement but rather

two requirements, namely “a filler for controlling thermal expansion of said composition **and** for assisting in reinforcing said bond” (emphasis added). Ayano does not even come close to teaching or suggesting inclusion of a filler that satisfies **both** of said two requirements. Thus, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1, 7, and 8 of “a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond”.

Even if Ayano taught or suggested a composition that could potentially impact thermal expansion of the composition (which Ayano does not teach or suggest as explained *supra*), claims 1, 7, and 8 require that the filler do much more than merely impact said thermal expansion of the composition. For example, claim 7 requires that **an effective amount** of the filler be added to the cyanate ester for **controlling** said thermal expansion of the composition. Similarly, claims 1 and 8 require that the filler actually **control** said thermal expansion of the composition, which requires that the filler be present in the composition in sufficient quantity to actually **control** said thermal expansion of the composition. Ayano does not teach or suggest that the filler be present in sufficient quantity to control the thermal expansion of the composition. Indeed, Ayano teach the opposite. Ayano teaches in col. 10, lines 41-47 that the additives (including the filler) “do not impair the essential properties of the resulting resin.” The preceding statement in Ayano is intended to limit the quantity of filler so that the filler cannot materially impair the essential properties of the resulting resin,” since if the filler were present in large amounts in the composition then the filler would obviously impair the essential properties of the composition. In other words, if the filler is limited in quantity so as not to impair the essential properties of the resulting resin, then the filler will consequently be limited in quantity so as not

to be able to control the thermal expansion of the composition. By so limiting the quantity of filler, Ayano is teaching away from having sufficient quantity of filler to control thermal expansion of the composition. In contrast, the specification of the present patent application discloses on page 24, lines 29-32 that “[t]he compositions of the present invention contain ... about 40% to about 75% by weight and preferably about 50% to about 60% by weight of the filler.” In any event, Ayano does not teach or suggest that the filler be present in sufficient quantity so as to be able to control the thermal expansion of the composition as required by claims 1, 7, and 8. Thus, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1 and 8 of “a filler for **controlling** thermal expansion of said composition” (emphasis added) and with respect to the corresponding feature in claim 7 of “adding to the cyanate ester substance **an effective amount** of a filler for **controlling** thermal expansion of said composition” (emphasis added).

Additionally, **the Examiner does not even allege** that Ayano teaches or suggest that the composition includes a filler capable of control the thermal expansion of the composition. Indeed, the final office action mailed 02/21/2003 is totally silent as to the thermal expansion of the composition. Because the Examiner did not even address the issue of the thermal expansion of the composition, the rejection of claims 1, 7, and 8 is improper, and Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1, 7, and 8 of “a filler for controlling thermal expansion of said composition. ...”.

In addition, Ayano in view of McCormick does not teach or suggest the feature “wherein

said metal cation in the organometallic complex is selected from the group consisting of elements of Periodic Groups IVB, VB, VIB, VIIB, and VIIIB” in claims 1, 7, and 8. The Examiner does not even allege that Ayano in view of McCormick teaches or suggest the preceding feature of claims 1, 7, and 8 (i.e., the metal cation being selected from Periodic Groups IVB, VB, VIB, VIIB, and VIIIB). The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claims 1, 7, and 8. Because the Examiner did not even address the preceding feature of claims 1, 7, and 8, the rejection of claims 1, 7, and 8 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claims 1, 7, and 8.

Based on the preceding arguments, Appellants respectfully maintain that claims 1, 7, and 8 are not unpatentable over Ayano in view of McCormick, and that claims 1, 7, and 8 are in condition for allowance.

#### Claim 6

Since claim 6 depends from claim 1 with respect to Ayano in view of McCormick, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants maintain that claim 6 is not unpatentable under 35 U.S.C. §103(a).

Additionally, Ayano in view of McCormick does not teach or suggest the feature “wherein said cyanate ester substance is solvent free”. The Examiner does not even allege that Ayano in view of McCormick teaches or suggest the preceding feature of claim 6. The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claim 6. Because

the Examiner did not even address the preceding feature of claim 6, the rejection of claim 6 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 6.

#### Claim 13

Since claim 13 depends from claim 8, with respect to Ayano in view of McCormick which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants maintain that claim 13 is not unpatentable under 35 U.S.C. §103(a).

Additionally, Ayano in view of McCormick does not teach or suggest the feature “further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyldimethoxysilane, 3-aminopropylethoxysilane, 3- glycidoxypropyl trimethoxysilane, 3-glycidoxypropylmethyl dimethoxysilane and combinations thereof”. The Examiner argues that “There is no evidence of record that the use of ... a surface treating agent in the instantly claimed composition results in a different polymerized product.”

In response to the preceding argument by the Examiner, Appellants contend that the composition of claim 13 must be different from the compositions of Ayano in view of McCormick if the compositions of Ayano in view of McCormick do not teach or suggest at least one of the following chemicals: vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyldimethoxysilane, 3-aminopropylethoxysilane, 3-glycidoxypropyl trimethoxysilane, 3-glycidoxypropylmethyl dimethoxysilane. Additionally, a

composition having a surfactant is different, by definition, from a composition not having a surfactant. Thus, the rejection of claim 13 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 13.

#### Claim 16

Since claim 16 depends from claim 1 with respect to Ayano in view of McCormick, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants maintain that claim 16 is not unpatentable under 35 U.S.C. §103(a).

Additionally, Ayano in view of McCormick does not teach or suggest the feature “further comprising a toughening agent selected from the group consisting of hydroxy-terminated polysulfone oligomers, elastomers, rubber, epoxy terminated elastomer, and combinations thereof”. The Examiner does not even allege that Ayano in view of McCormick teaches or suggest the preceding feature of claim 16. The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claim 16. Because the Examiner did not even address the preceding feature of claim 16, the rejection of claim 16 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 16.

#### Claim 17

Since claim 17 depends from claim 1 with respect to Ayano in view of McCormick, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants

maintain that claim 17 is not unpatentable under 35 U.S.C. §103(a).

Additionally, Ayano in view of McCormick does not teach or suggest the feature “wherein said polysulfone oligomers have molecular weights ranging between approximately 500 and approximately 5000”. The Examiner does not even allege that Ayano in view of McCormick teaches or suggest the preceding feature of claim 17. The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claim 17. Because the Examiner did not even address the preceding feature of claim 17, the rejection of claim 17 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 17.



## Issue 2

### CLAIMS 1, 6-8, 13, 16 AND 17 UNDER 35 U.S.C. §103(A) ARE NOT UNPATENTABLE OVER GAKU ET AL. (4,533,727) IN VIEW OF MCCORMICK ET AL. (5,215,860) AND SHIMP (4,709,008).

The Examiner rejected claims 1, 6-8, 13, 16 and 17 under 35 U.S.C. §103(a) as allegedly unpatentable over Gaku et al. (4,533,727) in view of McCormick et al. (5,215,860) and Shimp (4,709,008).

#### Claims 1, 7, and 8

Appellants respectfully contend that claims 1, 7, and 8 are not unpatentable over Gaku in view of McCormick and Shimp, because Gaku in view of McCormick and Shimp does not teach or suggest each and every feature of claims 1, 7, and 8. For example, Gaku in view of McCormick and Shimp does not teach or suggest the feature “a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond” in claims 1 and 8, and a similar feature in claim 7. The Examiner alleges that Gaku teaches that “[f]illers, such as silica, and reinforcing agents may be added”

In response to the preceding allegation by the Examiner, Appellants contend that Gaku does not teach “a filler for controlling thermal expansion of said composition”, as required in claims 1, 7, and 8. Appellants further contend that Gaku does not teach the “filler for assisting in reinforcing said bond”, as required in claims 1, 7, and 8. Thus, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1, 7, and 8 of “a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond”.

Appellants respectfully note that Gaku does not teach or suggest the use of a filler such as silica for “a filler for controlling thermal expansion of said composition **and** for assisting in reinforcing said bond” (emphasis added). Gaku does not teach or suggest inclusion of a filler such as silica that satisfies **both** of said two requirements. Thus, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1, 7, and 8 of “a filler for controlling thermal expansion of said composition” and the same filler “for assisting in reinforcing said bond”.

Even if Gaku taught or suggested a composition that could potentially impact thermal expansion of the composition (which Gaku does not teach or suggest as explained *supra*), claims 1, 7, and 8 require that the filler do much more than impact said thermal expansion of the composition. For example, claim 7 requires that **an effective amount** of the filler be added to the cyanate ester for **controlling** said thermal expansion of the composition. Similarly, claims 1 and 8 require that the filler actually **control** said thermal expansion of the composition, which requires that the filler be present in the composition in sufficient quantity to actually **control** said thermal expansion of the composition. Gaku does not teach or suggest that the filler be present in sufficient quantity to control the thermal expansion of the composition, and Gaku does not identify the amount of the filler (e.g., weight percent concentration) in the composition. Indeed, Gaku teach the opposite. Gaku teaches in col. 8, lines 23-26 that the fillers “do not impair the nature of the curable resin (A) or the cured product.” The preceding statement in Gaku is intended to limit the quantity of filler so that the filler cannot materially impair the nature of the curable resin or the cured product, since if the filler were present in large amounts in the composition then the filler would obviously impair the nature of the curable resin or the cured

product. In other words, if the filler is limited in quantity so as not to impair the nature of the curable resin (or the cured product), then the filler will consequently be limited in quantity so as not to be able to control the thermal expansion of the composition. By so limiting the quantity of filler, Gaku is teaching away from having sufficient quantity of filler to control thermal expansion of the composition. In contrast, the specification of the present patent application discloses on page 24, lines 29-32 that “[t]he compositions of the present invention contain ... about 40% to about 75% by weight and preferably about 50% to about 60% by weight of the filler.” In any event, Gaku does not teach or suggest that the filler be present in sufficient quantity so as to be able to control the thermal expansion of the composition as required by claims 1, 7, and 8. Thus, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1 and 8 of “a filler for **controlling** thermal expansion of said composition” (emphasis added) and with respect to the corresponding feature in claim 7 of “adding to the cyanate ester substance **an effective amount** of a filler for **controlling** thermal expansion of said composition” (emphasis added).

Additionally, **the Examiner does not even allege** that Gaku teaches or suggest that the composition includes a filler capable of control the thermal expansion of the composition. Indeed, the final office action mailed 02/21/2003 is totally silent as to the thermal expansion of the composition. Because the Examiner did not even address the issue of the thermal expansion of the composition, the rejection of claims 1, 7, and 8 is improper, and Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the feature in claims 1, 7, and 8 of “a filler for controlling thermal expansion of said composition. ...”.

In addition, Gaku in view of McCormick does not teach or suggest the feature “wherein said metal cation in the organometallic complex is selected from the group consisting of elements of Periodic Groups IVB, VB, VIB, VIIB, and VIIIB” in claims 1, 7, and 8. The Examiner does not even allege that Gaku teaches or suggest the preceding feature of claims 1, 7, and 8 (i.e., the metal cation being selected from Periodic Groups IVB, VB, VIB, VIIB, and VIIIB). The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claims 1, 7, and 8. Because the Examiner did not even address the preceding feature of claims 1, 7, and 8, the rejection of claims 1, 7, and 8 is improper. Accordingly, Appellants respectfully maintain that the Examiner not established a *prima facie* case of obviousness with respect to the preceding feature in claims 1, 7, and 8.

Based on the preceding arguments, Appellants respectfully maintain that claims 1, 7, and 8 are not unpatentable over Gaku in view of McCormick and Shimp, and that claims 1, 7, and 8 are in condition for allowance.

#### Claim 6

Since claim 6 depends from claim 1, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a) with respect to Gaku in view of McCormick, Appellants maintain that claim 6 is not unpatentable under 35 U.S.C. §103(a).

Additionally, Gaku in view of McCormick does not teach or suggest the feature “wherein said cyanate ester substance is solvent free”. The Examiner does not even allege that Gaku in view of McCormick teaches or suggest the preceding feature of claim 6. The final office action

mailed 02/21/2003 is totally silent as to the preceding feature of claim 6. Because the Examiner did not even address the preceding feature of claim 6, the rejection of claim 6 is improper.

Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 6.

#### Claim 13

Since claim 13 depends from claim 8, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a) with respect to Gaku in view of McCormick, Appellants maintain that claim 13 is not unpatentable under 35 U.S.C. §103(a).

Additionally, Gaku in view of McCormick does not teach or suggest the feature “further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyldimethoxysilane, 3-aminopropylethoxysilane, 3- glycidoxypentyl trimethoxysilane, 3-glycidoxypentylmethyl dimethoxysilane and combinations thereof”. The Examiner does not even allege that Gaku in view of McCormick teaches or suggest the preceding feature of claim 13. The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claim 13. Because the Examiner did not even address the preceding feature of claim 13, the rejection of claim 13 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 13.

#### Claim 16

Since claim 16 depends from claim 1, which Appellants have argued *supra* to be

patentable under 35 U.S.C. §103(a) with respect to Gaku in view of McCormick, Appellants maintain that claim 16 is not unpatentable under 35 U.S.C. §103(a).

Claim 17

Since claim 17 depends from claim 1, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a) with respect to Gaku in view of McCormick, Appellants maintain that claim 17 is not unpatentable under 35 U.S.C. §103(a).

### Issue 3

#### CLAIMS 13-15 AND 19-20 UNDER 35 U.S.C. §103(A) ARE NOT UNPATENTABLE OVER AYANO ET AL. IN VIEW OF MCCORMICK ET AL. (5,215,860), AND FURTHER IN VIEW OF CHRISTIE ET AL. (5,250,848) OR SWEI (5,182,173).

The Examiner rejected claims 13-15 and 19-20 under 35 U.S.C. §103(a) as allegedly “being unpatentable over Ayano et al. in view of McCormick et al. (5,215,860), as applied to claims 1, 7, and 8 above, and further in view of Christie et al. (5,250,848) or Swei (5,182,173)”.

#### Claims 13, 14, and 18

Since claims 13, 14, and 18 depend from claims 8 and 1, respectively, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a) in relation to the rejection under Ayano in view of McCormick (see discussion of Issue 1), Appellants maintain that claims 13, 14, and 18 are not unpatentable under 35 U.S.C. §103(a) over Ayano in view of McCormick and further in view of Christie or Swei.

Additionally, Ayano in view of McCormick and further in view of Christie or Swei does not teach or suggest the feature in claims 13, 14, and 18: “further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyldimethoxysilane, 3-aminopropylethoxysilane, 3-glycidoxypropyl trimethoxysilane, 3-glycidoxypropylmethyl dimethoxysilane and combinations thereof”.

The Examiner argues that “Ayano et al teach that the disclosed compositions but do not mention surface treating agents.... Christie et al teach analogous compositions comprising

epoxides and/or curable cyanate esters, reactive modifier and a filler that is optionally treated with a coupling agent. Christie et al teach preferably including an inorganic filler, preferably high purity or fused amorphous silica .... Swei disclose a composite filler material that is a filler material, such as silica, coated with a layer of silicone elastomer. The fillers are suitable for use in matrix materials such as cyanate esters. The silicone elastomer is the reaction product of a multifunctionally terminated polysiloxane and a silane crosslinking agent. See column 1, lines 30-49, column 2, lines 12-32 and column 5, lines 39-50.”

In response to the preceding argument by the Examiner, Appellants contend that the Examiner has even alleged that Christie or Swei teach or suggest any of the chemicals delineated in the preceding feature of claims 13, 14, and 18. Because the Examiner did not even address whether Christie or Swei teach or suggest any of said chemicals as part of the composition of claims 13, 14, and 18, the rejection of claims 13, 14, and 18 is improper.

The Examiner provides the following additional argument: “It would have been obvious to one skilled in the art to employ a filler such as the optionally surface treated filler in analogous compositions taught by Christie et al as the filler in the compositions taught by Ayano et al. Ayano et al provide motivation by teaching addition of filler. Christie et al teach that the preferred filler can be treated with a coupling agent, thus providing a filler and a surface treating agent, as required in the instantly claimed compositions.....”

In response to the preceding argument by the Examiner, Appellants contend that the Examiner has lumped the filler and the surface treating agent into one entity, namely a surface treated filler, which does not satisfy the requirements of claims 13, 14, and 18. In particular, the filler and the surface treating agent are independent elements of claims 13, 14, and 18.



Also in response to the preceding argument by the Examiner, Appellants contend that the Examiner has not provided a persuasive argument for modifying Ayano with a surface treating agent allegedly taught by Christie. In particular, the Examiner has not provided a reason why one of ordinary skill in the art would be motivated to add a surface treating agent to the invention of Ayano.

Based on the preceding arguments, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 13, 14, and 18.

#### Claim 15

Since claim 15 depends from claims 1 and 14, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants maintain that claim 13 is not unpatentable under 35 U.S.C. §103(a) over Ayano in view of McCormick and further in view of Christie or Swei.

Additionally, Ayano in view of McCormick does not teach or suggest the feature “wherein an amount of a surface treating agent includes from about 3 to about 15 parts based on 100 parts of the resin”. The Examiner does not even allege that Ayano in view of McCormick and further in view of Christie or Swei teaches or suggests the preceding feature of claim 15. The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claim 15. Because the Examiner did not even address the preceding feature of claim 15, the rejection of claim 15 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 15.

### Claims 19 and 20

Since claims 19 and 20 depend from claims 1 and 7, respectfully, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants maintain that claims 19 and 20 are not unpatentable under 35 U.S.C. §103(a) over Ayano in view of McCormick and further in view of Christie or Swei.

Additionally, Ayano in view of McCormick does not teach or suggest the feature “wherein said filler includes a fused or amorphous silica filler having a particle size from 0.5 to about 31 microns”.

The Examiner alleges: “Christie et al teach preferably including an inorganic filler, preferably high purity or fused amorphous silica having a particle size not greater than 31 microns, preferably 0.7 to 31 microns. See column 5, lines 3-28.... Christie et al also provide motivation to employ a filler having a particle size less than 31 microns and substantially free of alpha particle emissions so that the compositions will readily flow into gaps between a chip and substrate carrier and to avoid generation of electron/hole pairs.”

In response to the preceding argument by the Examiner, Appellants contend that the Examiner has not provided a persuasive argument for modifying Ayano with particle sizes of 0.5 to about 0.31 microns as allegedly taught by Christie. The Examiner’s argument relating to the compositions being able to readily flow into gaps between a chip and substrate carrier applies only to gaps of 31 microns or less between a chip and a substrate carrier, and Ayano does not disclose said gaps of said dimensions.

More importantly the Examiner has not provided a persuasive argument for modifying Ayano with particle sizes of 0.5 to about 0.31 microns as allegedly taught by Christie, because

the Examiner's argument relating to the compositions being able to readily flow into gaps between a chip and substrate carrier has no relevance to Ayano, since Ayano does not even mention a chip or a substrate carrier.

Based on the preceding arguments, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claims 19 and 20.

#### Issue 4

**CLAIMS 13-15 AND 18-20 UNDER 35 U.S.C. §103(A) ARE NOT UNPATENTABLE OVER GAKU ET AL. (4,533,727) IN VIEW OF MCCORMICK ET AL. (5,215,860) AND SHIMP (4,709,008), AND FURTHER IN VIEW OF CHRISTIE ET AL. (5,250,848) OR SWEI (5,182,173).**

The Examiner rejected claims 13-15 and 18-20 under 35 U.S.C. §103(a) as allegedly “being unpatentable over Gaku et al. (4,533,727) in view of McCormick et al. (5,215,860) and Shimp (4,709,008), as applied to claims 1,7 and 8 above, and further in view of Christie et al. (5,250,848) or Swei (5,182,173)” (emphasis added).

#### Claims 13, 14, and 18

Since claims 13, 14, and 18 depend from claims 8 and 1, respectively, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a) in relation to the rejection under Gaku in view of McCormick (see discussion of Issue 2), Appellants maintain that claims 13, 14, and 18 are not unpatentable under 35 U.S.C. §103(a) over Gaku in view of McCormick and further in view of Christie or Swei.

Additionally, Gaku in view of McCormick and further in view of Christie or Swei does not teach or suggest the feature in claims 13, 14, and 18: “further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyl dimethoxysilane, 3-aminopropylethoxysilane, 3-glycidoxypentyl trimethoxysilane, 3-glycidoxypentyl methyl dimethoxysilane and combinations thereof”.

The Examiner argues that “Gaku et al do not mention adding surface treating agents.... Christie et al teach analogous compositions comprising epoxides and/or curable cyanate esters, reactive modifier and a filler that is optionally treated with a coupling agent. See column 5, lines 3-28. It would have been obvious to one skilled in the art to employ a filler such as the optionally surface treated filler in analogous compositions taught by Christie et al as the filler in the compositions taught by Gaku et al, thus providing both instantly claimed filler and surface treating agent. Gaku et al provide motivation by teaching addition of filler and coupling agents. ”

In response to the preceding argument by the Examiner, Appellants contend that the Examiner has even alleged that Christie or Swei teach or suggest any of the chemicals delineated in the preceding feature of claims 13, 14, and 18. Because the Examiner did not even address whether Christie or Swei teach or suggest any of said chemicals as part of the composition of claims 13, 14, and 18, the rejection of claims 13, 14, and 18 is improper.

Also in response to the preceding argument by the Examiner, Appellants contend that the Examiner has lumped the filler and the surface treating agent into one entity, namely a surface treated filler, which does not satisfy the requirements of claims 13, 14, and 18. In particular, the filler and the surface treating agent are independent elements of claims 13, 14, and 18.

Additionally in response to the preceding argument by the Examiner, Appellants contend that the Examiner has not provided a persuasive argument for modifying Gaku with a surface treating agent allegedly taught by Christie. In particular, the Examiner has not provided a reason why one of ordinary skill in the art would be motivated to add a surface treating agent to the invention of Gaku.

Based on the preceding arguments, Appellants respectfully maintain that the Examiner

has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 13, 14, and 18.

#### Claim 15

Since claim 15 depends from claims 1 and 14, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants maintain that claim 13 is not unpatentable under 35 U.S.C. §103(a) over Gaku in view of McCormick and further in view of Christie or Swei.

Additionally, Gaku in view of McCormick does not teach or suggest the feature “wherein an amount of a surface treating agent includes from about 3 to about 15 parts based on 100 parts of the resin”. The Examiner does not even allege that Gaku in view of McCormick and further in view of Christie or Swei teaches or suggests the preceding feature of claim 15. The final office action mailed 02/21/2003 is totally silent as to the preceding feature of claim 15. Because the Examiner did not even address the preceding feature of claim 15, the rejection of claim 15 is improper. Accordingly, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claim 15.

#### Claims 19 and 20

Since claims 19 and 20 depend from claims 1 and 7, respectfully, which Appellants have argued *supra* to be patentable under 35 U.S.C. §103(a), Appellants maintain that claims 19 and 20 are not unpatentable under 35 U.S.C. §103(a) over Gaku in view of McCormick and further in view of Christie or Swei.

Additionally, Gaku in view of McCormick does not teach or suggest the feature “wherein said filler includes a fused or amorphous silica filler having a particle size from 0.5 to about 31 microns”.

The Examiner alleges: “Christie et al also provide motivation to employ a filler having a particle size less than 31 microns and substantially free of alpha particle emissions so that the compositions will readily flow into gaps between a chip and substrate carrier and to avoid generation of electron/hole pairs.”

In response to the preceding argument by the Examiner, Appellants contend that the Examiner has not provided a persuasive argument for modifying Gaku with particle sizes of 0.5 to about 0.31 microns as allegedly taught by Christie. The Examiner’s argument relating to the compositions being able to readily flow into gaps between a chip and substrate carrier applies only to gaps of 31 microns or less between a chip and a substrate carrier, and Gaku does disclose said gaps of said dimensions.

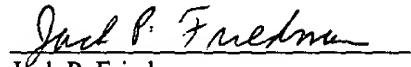
More importantly the Examiner has not provided a persuasive argument for modifying Gaku with particle sizes of 0.5 to about 0.31 microns as allegedly taught by Christie, because the Examiner’s argument relating to the compositions being able to readily flow into gaps between a chip and substrate carrier has no relevance to Gaku, since Gaku does not even mention a chip or a substrate carrier.

Based on the preceding arguments, Appellants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness with respect to the preceding feature in claims 19 and 20.

## SUMMARY

In summary, Appellants respectfully request reversal of the February 21, 2003 rejection of 1, 6-8, and 13-20.

Respectfully submitted,



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Dated: 07/21/2003

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants/Appellants: Papathomas et al.	)	Examiner: Berman, S
	)	
Serial No.: 09/471,520	)	Art Unit: 1711
	)	
Filed: 12/23/99	)	

For: **LEAD PROTECTIVE COATING COMPOSITION, PROCESS AND STRUCTURE THEREOF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**APPENDIX - CLAIMS ON APPEAL**

1. A composition for reinforcing a bond, comprising:

a cyanate ester resin consisting essentially of a cationically polymerizable cyanate ester monomer, a cyanate ester prepolymer, or a mixture of the monomer and prepolymer;

a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond; and

a polymerization photoinitiator comprised of a catalytically effective amount of an organometallic complex salt having a metal cation, upon photolysis, said polymerization photoinitiator liberating at least one coordination site and polymerizing the cyanate ester substance, wherein said metal cation in the organometallic complex is selected from the group consisting of elements of Periodic Groups IVB, VB, VIB, VIIB, and VIIIB.

6. The composition of claim 1, wherein said cyanate ester substance is solvent free.

7. A process for reinforcing a bond, said process comprising the steps of:

providing a cyanate ester substance consisting essentially of a cationically polymerizable cyanate ester monomer, a cyanate ester prepolymer, or a mixture of the monomer and prepolymer;

adding to the cyanate ester substance an effective amount of a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond; and

adding to the cyanate ester substance a polymerization photoinitiator comprised of a catalytically effective amount of an organometallic complex salt having a metal cation, upon photolysis, the polymerization photoinitiator liberating at least one coordination site and curing the cyanate ester substance, wherein said metal cation in the organometallic complex is selected from the group consisting of elements of Periodic Groups IVB, VB, VIB, VIIB, and VIIIB.

8. A lead protective composition for reinforcing a bond, comprising:

1. at least one cyanate monomer;

2. a polymerization photoinitiator comprised of a catalytically effective amount of an organometallic complex salt having a metal cation, the polymerization photoinitiator liberating at least one coordinative site and polymerizing the at least one cyanate monomer, wherein said metal cation in the organometallic complex is selected from the group consisting of Periodic Groups IVB, VB, VIB, VIIB, and VIIIB; and

3. a filler for controlling thermal expansion of said composition and for assisting in reinforcing said bond.

13. The lead protective composition of claim 8, further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyl dimethoxysilane, 3-aminopropylethoxysilane, 3-glycidoxypropyl trimethoxysilane, 3-glycidoxypropylmethyl dimethoxysilane and combinations thereof.

14. The composition of claim 1, further comprising a surface treating agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyl dimethoxysilane, 3-aminopropylethoxysilane, 3- glycidoxypropyl trimethoxysilane, 3-glycidoxypropylmethyl dimethoxysilane and combinations thereof.

15. The composition of claim 14, wherein an amount of a surface treating agent includes from about 3 to about 15 parts based on 100 parts of the resin.

16. The composition of claim 1, further comprising a toughening agent selected from the group consisting of hydroxy-terminated polysulfone oligomers, elastomers, rubber, epoxy terminated elastomer, and combinations thereof.

17. The composition of claim 16, wherein said polysulfone oligomers have molecular weights ranging between approximately 500 and approximately 5000.

18. The process of claim 7, wherein the process further comprises adding a surface treating

agent selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, N(2-aminoethyl)3-aminopropyl methyldimethoxysilane, 3-aminopropylethoxysilane, 3-glycidoxypopyl trimethoxysilane, 3-glycidoxypopylmethyl dimethoxysilane and combinations thereof.

19. The photoinduced polymerizable cyanate ester composition of claim 1, wherein said filler includes a fused or amorphous silica filler having a particle size from 0.5 to about 31 microns.

20. The process of claim 7, wherein said filler includes a fused or amorphous silica filler having a particle size from 0.5 to about 31 microns.